

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**UNIT #1 - ALGEBRAIC ESSENTIALS REVIEW**  
**COMMON CORE ALGEBRA II**

**Part I Questions**

1. Which of the following is algebraically equivalent to the sum of  $4x^2 - 8x + 7$  and  $3x^2 - 2x - 5$ ?

(1)  $7x^2 - 10x + 2$

(3)  $7x^4 - 10x^2 + 2$

(2)  $7x^2 - 6x - 12$

(4)  $12x^4 + 16x^2 - 35$

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2. When the expression  $5x(2x + 5) - x^2 + 4x$  is simplified it is equivalent to

(1)  $8x^2 + 21x$

(3)  $9x^2 + 21x$

(2)  $6x^2 + 29x$

(4)  $9x^2 + 29x$

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3. For  $x = -6$ , the rational expression  $\frac{x^2 - 4x}{2x + 4}$  has a value of

(1)  $\frac{7}{5}$

(3)  $-\frac{8}{3}$

(2)  $-\frac{15}{2}$

(4)  $\frac{11}{4}$

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4. The solution to  $\frac{x-8}{2} + \frac{1}{3} = 7$  is which of the following?

(1)  $5\frac{1}{2}$

(3)  $-14\frac{2}{3}$

(2)  $8\frac{1}{6}$

(4)  $21\frac{1}{3}$

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5. For which of the following values of  $k$  will the equation  $5(2x + 3) - 8 = 10x + k$  be an identity?

(1)  $k = 6$

(3)  $k = 7$

(2)  $k = -5$

(4)  $k = 15$

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6. Which of the following equations would have no values of  $x$  in its solution set?

- (1)  $8x + 3 = 6x - 7$                       (3)  $3(2x + 1) - 7 = 6x - 4$   
(2)  $4(x + 1) - 2x = x + 5$               (4)  $5(x + 2) = 2(2x - 3) + x$

7. If  $y = 10 - 2\sqrt{x + 11}$ , then what is the value of  $y$  when  $x = 25$ ?

- (1)  $-2$                                           (3)  $-22$   
(2)  $48$                                           (4)  $16$

8. The exponential expression  $(-2x^2)^3(5x^4)$  can be rewritten equivalently as

- (1)  $-40x^{10}$                                   (3)  $30x^{24}$   
(2)  $-10x^{10}$                                   (4)  $24x^{12}$

9. The monomial  $36x^4y^{10}$  can be written as the product of  $-3x^2y^2$  with which of the following

- (1)  $12x^2y^5$                                   (3)  $-12x^2y^8$   
(2)  $12x^2y^8$                                   (4)  $-12x^2y^5$

10. Which of the following values of  $x$  is a zero of the expression  $x^3 + 5x^2 + 11x + 15$ ?

- (1)  $x = 5$                                       (3)  $x = 7$   
(2)  $x = -3$                                       (4)  $x = -1$

11. If the product of the binomial  $(2x - 5)$  with the trinomial  $(3x^2 + 2x - 5)$  is formed, what is the coefficient of the  $x^2$  term?

- (1)  $-11$                                           (3)  $7$   
(2)  $-2$                                           (4)  $9$



## Free Response Questions

12. Write the following expression in the form  $ax^2 + bx + c$ , where  $a$ ,  $b$ , and  $c$  are real number constants.

$$(x+6)(x+5) + (x+6)(x-2)$$

13. Algebraically determine the intersection point of the lines whose equation are shown below. Show the work that leads to your answer. Check your result on your graphing calculator.

$$y = 5x + 17 \quad \text{and} \quad y = \frac{1}{2}x + 8$$

14. Consider the equation  $7x - 3 = 2(2x - 3) + 3(x + 1)$ .

(a) Show that  $x = 5$  and  $x = -1$  are solutions to this equation.

(b) This is a linear equation. Typically, we expect linear equations to have only one solution. How can this equation have at least two solutions as you showed in part (b)? Explain.



15. Given the expression  $(x-5)(2x+7)$  do the following:

(a) Show that  $x=5$  is a zero of the expression.

(b) What is the other zero of the expression? Show how you arrive at your answer.

16. The cubic expression  $x^3 - 6x^2 - 31x + 120$  has three integer zeroes on the interval  $-10 \leq x \leq 10$ . Use technology to determine the zeroes. Explain how you found them.

17. If  $(x^3)^2 (x^a) = x^{10}$  for all values of  $x$ , then what is the value of  $a$ ? Explain how you arrived at your answer.

18. Write the algebraic expression below in simplest terms. Then, check the equivalence between the original expression and your simplification by testing a value.

$$2x(x+5) - 4(x-3) + 8$$

